CENTRAL INTELLIGENCE AGENCY

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SUPPLEMENT TO REPORT NO.

[redacted]

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[redacted]

THIS IS UNEVALUATED INFORMATION

[redacted]

25X1 1. [redacted] at OSW, Berlin, in August 1945, [redacted] work on copying the American 723 A/B 3 cm klystron [redacted] begun at Telefunken during World War II. Copy work was shortly finished and the klystron readied for production. Pilot production started at OSW although some difficulty was experienced in procuring suitable materials and in obtaining sufficient vacuum, but these problems were gradually overcome. Samples of this type klystron were sent to Svetlana Tube Factory at Leningrad after the departure of the Germans to the USSR in October 1946. [redacted] Samples of the copies 723 A/B were also sent to Institute 160, Fryazino, prior to the departure of the Germans from OSW, and subsequently designated as the Soviet K3-1, K3-2 and K3-3. The K3-1 covers the range 3.05 to 3.5 cm; the K3-2 2.9 to 3.05 cm; and the K3-3 the range of 3.5 to 4 cm. The latter designations were given to these tubes after copying and production had started in the USSR. Tools and jigs for production were sent to Svetlana during the middle of 1947 and were set up for operation by Dipl Ing Alfred Uberrueck. (Uberrueck returned to East Germany in December 1950, worked two weeks at OSW, and then disappeared.

[redacted]

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2. When the Germans first arrived at Institute 160 a few British type CV-22 10 cm klystrons were on hand in the Radio Physics Laboratory. These tubes worked fairly well under laboratory conditions, but the Soviet copy, designated as the K10-1, was extremely poor in operation, due principally to the fact that no qualified personnel were at that time engaged in klystron work. Soviet female engineer [illegible] in charge of the klystron program and even though she was an intelligent woman and had previously worked with a qualified Soviet engineer, Nikiforov, she was not competent for the position she held. To assist her, two girls with no technical background whatsoever had been hired from the village of Fryazino. Nikiforov, with whom she had previously worked, was sent to OSW in 1946 to investigate klystron techniques. He came back to Institute 160 for a period of two weeks in 1947 and was then transferred to the Svetlana Plant in Leningrad, where he is employed at the present time.

3. After the Germans arrived, Behlke, Gross, and Schroeter constructed jigs for the production of K10-1 type klystrons and also began work on copying the American klystron type K-28, which was designated as the Russian K10-2 type. These tubes were placed in limited production by the end of 1947 and were in fairly large scale production by the end of 1948. Germans Willi Siems and Milde acted as liaison between the development laboratory and the factory concerning production of these klystrons. [redacted] by April 1952 production of the type K10-2 reached several thousand per month. At the beginning of 1949 the K10-1 was dropped from production. In 1949, 10 to 15 of type K10-2 were tested in the klystron laboratory per day. Poor construction techniques accounted for 70 to 80% rejects in 1948, but by the end of 1949 rejects of the K10-2 dropped to 50% and remained at this figure until the Germans departed for repatriation in April 1952.

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4. Other klystron types in production at Institute 160 are the KT-2 (1.94 to 2.06 cm), KT-3 (3.05 to 3.35 cm), and KT-10 (9.3 to 10.8 cm). Each of these types is thermally tuned for fine frequency adjustment. A broad-band klystron is under development for a range of 2.8 to 4.5 cm; however, the exact Russian designation is unknown. The klystron was developed by Soviet engineers although the Germans Kolberg and Werner actually constructed the models. This type was worked on for a period of only two weeks before the Germans left Institute 160. [redacted] four or five of them came from various institutes in Moscow (names unknown) four to six weeks before the Germans left.

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5. No high-power klystron work has been undertaken at Institute 160, but what was claimed by the Soviets to be a high-power 2-chamber type was developed by Devyatkov and Kovalenko at an institute in Moscow (name unknown) before the German Group arrived at Institute 160. [redacted] Kovalenko was chief of the Klystron Laboratory from 1948 to the beginning of 1952, at which time he was relieved of his assignment but stayed on at Institute 160 as a technical consultant. Devyatkov was assigned as Director of the Scientific Section in 1948 and still holds that position. During the period 1946 to 1948, Devyatkov was assigned to OSW in Berlin. When Kovalenko was relieved as Chief of the Klystron Laboratory in early 1952, he was replaced by Afanasyev, who had been previously assigned to OSW. How long Afanasyev was at OSW is unknown to me.

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25X1 [redacted]

6. In mid-1950 a Soviet brought two broad-band klystrons to Institute 160 from an unknown institute in Moscow. One of these tubes is tunable over the range 3.5 to 6.5 cm, the other from 5 to 9 cm. Each has an output of 15 to 20 mw and is used at Institute 160 in signal genera-
25X1 tors. [redacted] a klystron of the same type explained in the American publication "Proceedings of IRE". The two klystrons differed only in the frequency range covered. They were extremely poor in operation because of frequency jumping.

MAGNETRON DEVELOPMENT:

7. Two types of zero slot magnetrons, which had been developed previously at OSW, were constructed at Institute 160 to be used in low-power signal generators for test purposes. The tubes differed only in the band of frequencies covered, one tunable from 1.5 to 6 cm, the other from 5 to 12 cm. Neither of these magnetrons was very successful in operation because of the extremely short heater life.

8. Magnetrons in quantity production at Institute 160 are manufactured in a separate building constructed expressly for this purpose. Chief of this section is Feodosiyev, who was formerly employed at OSW. Both CW and impulse types are produced, although the greatest emphasis is
25X1 placed on copying American impulse types. Actual samples of the mag-
25X1 netrons to be copied are relied upon, in addition to articles appearing in the "RCA Review" and the "Bell System Technical Journal". German
25X1 samples from OSW were also utilized in the 10, 3, and 2 cm bands. [redacted]
25X1 [redacted] production of the 2 cm magnetron began, [redacted]
25X1 [redacted] sometime before 1951. One of the German-copied mag-
25X1 netrons had a peak power output of one megawatt. [redacted]
25X1 [redacted] it to be a 10 cm type. The modulator for the one megawatt magnetron was developed by the German Grimm.
25X1 The only German who worked with the Soviet chief Feodosiyev was a mechanic, Hans Siems.

9. The Soviet chief for CW magnetron development is Zuzmanovskiy who studied to the "Kandidat" level at the Technische Hochschule in Berlin/
25X1 Charlottenberg. Germans Heinz Gromadis and Helmuth Stolle worked with
25X1 Zuzmanovskiy. CW magnetrons for wavelengths of 10, 3, 2, and 1 cms
25X1 were developed and placed in production. [redacted]
25X1 [redacted] development of the 1 cm type (.98-1.03 cm) was completed in 1951. [redacted] all types are copies of either
25X1 American or German developments, with the exception of one which Zuzmanovskiy claimed was a great improvement over the German LMS-32, a mechanically continuously tuned magnetron. [redacted]
25X1 [redacted]

10. [redacted] "packaged" magnetrons, [redacted]
25X1 Zuzmanovskiy had plans to develop them. Much trouble was experienced
25X1 by the Soviets with obtaining sufficient field strength permanent in the magnets used with magnetron tubes.

11. [redacted]

TEST DEVICES FOR CENTIMETER WAVELENGTHS:

12. Four days prior to the mass deportation of OSW specialists to the USSR, Dr Karl Steimel, Dr Eitel Spiegel, Dipl Ing Wilhelm Grimm, Floehr, and Zikanke were flown to Monino [56° 05' N - 32° 48' E] from Berlin. These men were told by the Soviets that they were to complete a small task concerning the testing of magnetrons, and would be returned to Berlin within two weeks. [They returned five years

25X1 [redacted]

later.7 They took with them a spectrum analyzer which had been developed by Grimm and Zikanke at OSW and which was put into use at Institute 160. Specifications of this instrument are as follows:

(a) Range covered: 8-12 cm. Modified in 1947/1948 to include 3-3.5 mc.
(b) Input: 70 ohms coaxial for 8-12 cm, waveguide for 3.0-3.5 cm.
(c) Sensitivity: .5 millivolt to 70 ohm input.
(d) CRT display
(e) Width of spectrum displayed: 50 mcs

13. [redacted] Klystron Development Laboratory, [redacted] Until 1949, when he was arrested for political reasons, Dr Warner Vogi was also concerned with the development of cm test gear. Prior to 1949, only the Germans were concerned with this program; however, at that time the Soviets came into the group and in December 1950 took over the development and construction of centimeter test equipment entirely. At the time of his arrest Dr Vogi was engaged in developing test equipment for one-and two-centimeter wavelengths. The actual bands to be covered by this equipment were .98 to 1.03 cm and 1.96 to 2.04 cm. In the early part of 1949 a 1 cm signal generator was brought to Institute 160 from an institute in Moscow [redacted] The reflex klystron used in this instrument was Soviet-made and had a power output of approximately 10 mw. Output of the 1, 2, and 3 cm klystrons was measured by bolometers and thermistors. Magnetron output was measured by the calorimetric method of measuring the temperature rise of water. Most of the test equipment in Institute 160 was taken from OSW, although during 1950 and 1951 Soviet-produced test equipment began to arrive from Moscow. Thermistors received from Moscow were especially good.

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14. For sometime after the first group of Germans were sent back to East Germany in December 1950, the Soviets at Institute 160 experienced considerable difficulty with test equipment, especially the more complicated types. For example, if trouble was experienced with a rather complicated "Q" meter, the Soviets had a very difficult time effecting the necessary corrections. Although recent Soviet engineering graduates are well founded in theory, they greatly lack the necessary practical experience which only time can bring.

15. Dr Eitel Spiegel developed DC amplifiers for measuring purposes and IF amplifiers for frequencies of 15 to 20 mcs and 60 to 90 mcs.

16. All klystrons were subjected to vibration tests in the range of 15 to 20 cps, in both vertical and horizontal positions, at 4 to 5 G's.

CRYSTAL DETECTORS:

17. 10 cm silicon video detectors were copied from the Western Electric type and designated as the Russian type KD-3. A 10 cm mixer version of the same US type was designated as the KD-2. A 3 cm video crystal, the KD-6, was copied from the German ED-701 to ED-707 series. The Russian KD-8 is a 2 cm selected version of the KD-6. The KD-2, KD-3, KD-6, and KD-8 have been in quantity production since the beginning of 1950, [redacted] By April 1952 approximately 100 pilot models of a 1 cm cavity detector were completed and quantity production was ready to commence. [redacted] Tantalum cat whiskers were used for all mixer crystals, wolfram or molybdenum for video. The Germans concerned with crystal detectors at Institute 160 were Dr E Schloemilch and Dr Kurt Richter. A very intelligent young Soviet engineer worked with Dr Richter on germanium detectors [redacted] All German engineers were taken off crystal detector work after 1951.

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25X1 [redacted]

TRANSISTORS:

18. The Soviets were greatly interested in transistors and 3 or 4 samples from the US arrived at Institute 160 during the early part of 1951. Copies of this type were intended, but [redacted] none was ever constructed. None of the German group was concerned with transistors and the only Soviet known to me who worked in this field was Krasilov .

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MINIATURE TUBES:

19. The Soviet Zhchustim was chief of the laboratory for miniature tube development during the entire stay of the Germans and was assisted by Dr Kurt Mie, technician Krueger, and mechanic Fischer (Dr Mie actually did not arrive at Institute 160 until 1947). The majority, if not all, of the standard American miniature types were copied and are produced. [redacted] work on sub-miniature tubes was never undertaken at Institute 160. [redacted] At the beginning of 1951 the Germans Milde, Ganswind (?), and Munte joined this group after being relieved of duty in the klystron laboratory.

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SPARK GAP MODULATORS:

20. A high-power spark gap modulator is available at Institute 160, [redacted] this modulator was one which had been developed by a Dr Splechtner at OSW. Splechtner had previously worked on such a modulator at Telefunken and OSW. When the German group was deported from OSW in 1946, Splechtner was sent to Gorkiy. He disappeared from Gorkiy at the same time in 1949 when Dr Vogi was arrested. [Comment: A forthcoming interview [redacted] will include questions concerning the development and use of hard tube and hydrogen thyratron modulators.]

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VERY HIGH POWER VACUUM TUBES:

21. In 1948 a 1000 kw water-cooled triode suitable for low and medium frequencies was developed by Zuzmanovskiy. [redacted] heard the Soviets mention that it was to be used for a jamming transmitter. [redacted]

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VISITS BY MILITARY PERSONNEL TO INSTITUTE 160:

22. Several uniformed Soviet Air Force personnel (the Germans believed them to be captains) visited the Institute several times in 1949 and 1950, apparently for technical inspections. They appeared to be interested in work being conducted on copying the German metal-ceramic tube type LD-11 and the 723 A/B klystron. [redacted] one naval officer visited the Institute during the same period. [redacted] since the Air Force visited more frequently and displayed more interest, that the cm wavelength vacuum tubes manufactured at Institute 160 are used for air force purposes. [redacted] the Germans heard in 1948 that an American SCR 584 radar or copy thereof would be sent to Institute 160 from Moscow. [redacted]

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25X1 [redacted]

23. Toward the end of 1948 Zuzmanovskiy asked personnel of his laboratory to undertake the construction of 10 cm jamming equipment. The equipment consisted of a noise-modulated tunable klystron which operated on a spot frequency while a second klystron was mechanically swept by an electric motor over a range of approximately 100 mcs and served as the local oscillator for a radar receiver. Zuzmanovskiy was apparently satisfied that the principle worked and nothing further was done on the project. The equipment remained at Institute 160. [redacted]
25X1 Zuzmanovskiy gained the idea from available American technical literature and was interested only in determining results of the idea.

OTHER VACUUM TUBE PLANTS IN THE USSR:

24. Novosibirsk: When Dr Steimel and the other four German engineers, who preceded the mass deportation from OSW, arrived in Monino (they were sent to the Saniterium Monino for billeting purposes only, but actually worked in Institute 160), they were told by the Soviet Katzman, from the Ministry for Telecommunications Equipment in Moscow, that they would be retained in the USSR for several years.
25X1 About six months later Katzman became the Director of the Vacuum Tube Factory at Novosibirsk and still held this position when the
25X1 last of the German group was sent home in April 1952. [redacted]
25X1 [redacted] metal-ceramic tubes were being manufactured there. The principle problems which
25X1 Richter was to solve were (1) insufficiently active getters which had been produced at Institute 160 and (2) cathode poisoning from ceramic soldering materials. These difficulties were being experienced on Soviet copies of the German tube types LD-11 and LD-12. One year after his visit, a Soviet engineer from Novosibirsk came to Institute 160 to consult Richter on a few minor problems concerning metal-ceramic tube production. During the conversation Richter gained the impression that the Soviets had succeeded in solving the majority of
25X1 their problems. Very little information was gained by Richter during
25X1 his visits to Novosibirsk since he was consulted in a room separated from the actual production in the factory. [redacted]
25X1 [redacted] Only Soviet personnel are employed in this plant.

25. Svetlana Plant, Leningrad: [redacted]
25X1 in 1947, [redacted] production T-R tubes for 3 cms, all types of conventional receiver tubes, and small transmitter tubes. [redacted]
25X1 no miniature type tubes. [redacted]

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26. Tashkent: This factory was built during WW II, is very large, and,
25X1 [redacted] manufactures only conventional receiver
25X1 types.

27. Saratov: The factory was only recently completed. [redacted]
25X1 [redacted]

28. Moscow: Several large laboratories located in Moscow, although not
25X1 classed as factories, actually produce quantities of vacuum tubes and should be included in the USSR vacuum tube potential. [redacted]
25X1 [redacted]

29. [redacted] the Svetlana Plant and those located at
25X1 Fryazino, Tashkent, and Novosibirsk are administered by the Ministry for Telecommunications Equipment in Moscow, [redacted]
25X1 [redacted]

25X1

 [redacted]

SEMI-CONDUCTORS:

30. Nothing was done in this field at Institute 160, but some work was done at institutes in Moscow and Leningrad. [redacted] 25X1
25X1 [redacted] Russian type T-8, approximately 8 mm long, and type T-9, about 5-6 mm long, were received at Institute 160. The quality was excellent.

MAGNETIC AMPLIFIERS:

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31. [redacted]

WAVE GUIDES:

32. Wave guides were constructed at Institute 160 for use only in test equipment associated with the development of magnetrons and klystrons, although some 3 cm wave guides were received from an unknown institute. All were constructed of copper, were rectangular, and silver plated inside and out. Dimensions of both waveguides and coaxial transmission lines in use at Institute 160 are listed below:

WAVEGUIDES

Wavelength	Dimensions
1 cm	4.5 x 7.3 mm
2 cm	8 x 17 mm
3 cm	10 x 23 mm
	12.5 x 28.5 mm
5 cm	24 x 48? mm
10 cm	34 x 72 mm
1 meter	Dimensions unknown but peak power capacity is 1 megawatt

CONCENTRIC TRANSMISSION LINES
(Z_o = 70 ohms)

For 10 cm wavelength:	Air dielectric, 5 mm inner conductor, outer conductor 16 mm
For 10 cm and longer wavelengths:	Polyethylene dielectric, 9.8 mm inner conductor, 31.2 mm outer

ICONOSCOPES:

33. [redacted] 25X1
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iconoscopes and associated test gear were constructed and sent to an unknown destination. Conventional photocells were also produced.

COMPUTERS:

34. No development was done at Institute 160, but a digital type mechanical computer was delivered from Moscow at the beginning of 1950. This computer was requested by Lukoshkov, Chief of the Theoretical Department, but great difficulty was experienced with the machine because of faulty relays and the Soviets much preferred to use the abacus as a simple aid in solving mathematical problems. Dr Steimel worked to improve the operation of the machine, but finally decided that it was a hopeless task.

TRAVELING WAVE TUBES:

35. No Germans were involved with the project, but in the beginning of 1952 the Soviets began work on a traveling wave tube. No details were revealed to me, but [redacted] more knowledgeable Soviets on the subject are to be found in Moscow, since a man was assigned from a Moscow institute for the express purpose of assisting in the project at Institute 160.

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TECHNICAL LITERATURE AT INSTITUTE 160:

36. American and British publications were much preferred by the German engineers as well as the better qualified Soviets. Very little if any original information appeared in Soviet periodicals. Russian technical periodicals are offered for sale at any Moscow bookstore, but translated foreign literature is available only from libraries. Only Soviets were allowed access to translated foreign technical literature in the libraries and the German engineers were denied this privilege unless they obtained a special pass signed by the Soviet department head. In addition to the special pass, each German had to be accompanied by and vouched for by a Soviet. Only limited quantities of Russian technical periodicals, such as "Radio Tekhnika", are published. The scientific institutes are supplied first, and left-over copies are distributed to bookstores.

37. Although nothing original was presented, a pooling of known information concerning klystron development was prepared by Kovalenko and published in 1950 under the title of "Klystrons". Occasionally, articles written by Kvozdover on klystrons appeared in Russian technical periodicals. The latter is a professor in a Moscow university and frequently visited Institute 160 as a consultant. Kvozdover is 50 to 55 years of age and previously spent some time in Germany. [redacted] the periodical "Radio Tekhnika" sometimes carried articles on klystrons by Kvozdover. [redacted] they appeared in other periodicals also, [redacted]

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SOVIET ELECTRONICS ENGINEERS:

38. [redacted] the Soviet laboratory chiefs are well qualified technically. Most of these people had previously studied in Germany or Great Britain. For the past few years a very extensive formal and on-the-job training program has been conducted in the USSR in the field of electronics. Although difficult to pursue to completion, a number of persons at Institute 160 were taking correspondence courses in electronics subjects. Following completion of these courses, which consist of several years off-duty study plus on-the-job practice, extensive examinations may be taken for an engineer's diploma. This course was normally pursued by the more ambitious members of the "Bronze Medal" class students (classified on completion of primary school). Since this procedure for acquiring an engineer's diploma or the title "Jung Ingeneur" meant approximately five years of study in addition to performing the normal work expected of a factory employee, and as only the poorer primary students fall into the "Bronze Medal" category, a very small percentage ever completed the requirements. These students, or "Jung Technikas", acted as laboratory assistants in the Institute. After a period of practical experience, the time depending on the individual, they become known as "Technikas". As they become more proficient they become known as "Alt Technikas". Pay increases accompany each of the foregoing promotions.

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39. After 10 years of primary school, at which time the student averages 18 years of age, the "Gold Medal" (1st class) students automatically proceed to universities. The second group, according to grades received in primary school, commonly known as "Silver Medal" students, are required to take further examinations for entrance to universities. "Bronze Medal" students have the possibility of attending the universities if they successfully pass extensive pre-entrance examinations. University engineering graduates are first known as "Jung Ingeneurs" and successively promoted to the titles of "Ingeneur" and "Alt Ingeneur". [redacted] the university trained engineers
25X1 are as well qualified in theory as their German equivalents; however, they are lacking in practical laboratory experience. This situation is recognized by the Soviets and is being rapidly improved. Rectification of this situation, however, must necessarily mean increased training time since a student is required to pass an extensive examination in political knowledge before graduation, and preparation for this examination takes away valuable time from technical studies.

40. Although increased salaries accompany each promotion in the ranks of engineers and technicians, no increase is made in concessions concerning food, clothing, or housing. Increased pay may also be gained by successfully passing an examination in any foreign language. The
25X1 more proficiency demonstrated, the greater the increase in pay.

41. Toward the end of the Germans' stay at Institute 160, [redacted] the best qualified graduates came from the Lomonosov University in Moscow. This university is now only two years old and is located in the Leninskye Gori district of Moscow. It is considered to be the largest university in the Soviet Union.

OTHER GERMAN GROUPS IN THE USSR:

42. Guidance Group headed by Dr Bushbeck /When queried concerning the
25X1 activities of this group, [redacted] replied [redacted] 25X1
25X1 [redacted] that the group was concerned only with servo-mechanisms. The question concerning the relative positions of Monino Sanitorium and the institute in the village of Monino (56° 05' N - 32° 48' E) proper, which served as the working site for the Bushbeck Group, was
25X1 clarified [redacted] as follows:/

(a) The Sanitorium Monino served merely as living quarters for a part of the Germans who were actually employed at Institute 160 in Fryazino. In 1948 this entire group was moved to the town of Fryazino and the Sanitorium again became the property of the Soviet Air Force, to be used for the purpose for which it was originally constructed.

(b) Toward the end of 1950 Dr Bushbeck and a few members of his group were transferred to an institute in Moscow [redacted] 25X1
25X1 [redacted] The rest of the group remained in the village of Monino. In the early part of 1952 a member of the Bushbeck Group in Moscow remarked to Dr Schuettloeffl that the Institute 160 personnel were indeed fortunate in being returned to Germany since they, themselves, had been notified that they were not to return for several years. Members of the group who accompanied Bushbeck to the Moscow Institute in 1950 reportedly signed a contract for an additional four years in the USSR. The entire complement of Germans who were left in Monino in 1950 (approximately 30 people) were returned to East Berlin on April 22 of this year. [redacted] 25X1
[redacted] 25X1

25X1 [redacted]
25X1

43. The night before the train left Fryazino to return the German group to East Germany, three former OSW employees, Dr Schuettloeffl,
25X1 Rehbock, and Preiszner arrived by bus from Moscow and returned with the Institute 160 group. [redacted]

OTHER SOVIET ELECTRONIC INSTITUTES:

44. Institute #20, sometimes referred to as "The Moscow Institute" under the supervision of Admiral Berg, originated some of the klystron development tasks which were undertaken at Institute 160. [redacted] 25X1
[redacted] this institute probably is concerned with the development and possibly the production of operational equipment for cm wavelengths. Projects originated by Institute #20 are not submitted to Institute 160 directly, however, but are forwarded through the Ministry for Telecommunications Equipment, the proper channel for all tasks undertaken by institutes and factories under its jurisdiction. Once the project is assigned through proper channels, direct coordination is then effected between Institute 160 and the originating institute or factory concerned. /[redacted] pressed for names 25X1
of other establishments which originate tasks eventually assigned to Institute 160, but he knows of nothing specific beyond the fact that several institutes in addition to #20 do exist in Moscow./ Steimel, Grimm, Spiegel, and Vogl actually visited the premises of Institute #20 sometime in 1947. [redacted] 25X1
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25X1 45. In 1949 notice was served to the Germans that they were absolutely
25X1 forbidden under the threat of heavy penalty to visit the city of Zagorsk. Although the reason was never made known we naturally assumed that something of great importance must be located there.

46. /Since there have been some indications regarding the possibility of a vacuum tube plant located along the railroad between Moscow and Leningrad, [redacted] was queried for knowledge of such an establishment.
25X1 He knows of no such plant and related that if one does exist it is probably in Klin, since this is the only city in the vicinity capable of supplying a labor force./

RETURN OF INSTITUTE 160 GERMANS TO EAST BERLIN:

47. Upon arrival in East Berlin on 22 April 1952, the German group was temporarily billeted in a guest house supervised by the Zentral Amt f. Forschung u. Technik. At a general meeting that night [redacted] ad- 25X1
dressed by Prof Laenge, Chief of the Zentral Amt, concerning positions available in East German electronic firms. Dr Ulrich, the technical director of OSW, was also present. In general it was said that the DDR is extremely deficient in high-caliber electronics personnel and that the recent returnees were welcomed with open arms. Although not openly said, it was definitely inferred that all of the better qualified men had defected to West Germany. Mailing addresses of those present at this meeting were taken so that individual offers

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could be mailed later. [redacted]

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MARKINGS ON VACUUM TUBES PRODUCED AT INSTITUTE 160:

48. [redacted] a sketch of a typical marking appearing on vacuum tubes produced at Institute 160. /See Enclosure (B)./ [redacted]

25X1 [redacted]

-end-

ENCLOSURE (A) Klystrons in Development & Production at Institute 160
ENCLOSURE (B) Typical Markings on Vacuum Tubes Produced at Institute 160

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[redacted] Comment: The correct spelling of the obviously garbled name Zhchustim is uncertain, but may possibly be Zakustin.

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KLYSTRONS IN DEVELOPMENT & PRODUCTION
AT INSTITUTE 160

Type No	Wavelength (cm)	Cavity Acc Voltage	Beam Current (ma)	Repeller Volts	Tuning Range (mc)	Power Output (mw)
K10-2	8.5-11.5	+250	20-25	-80 -150	15-18	75-120
K3-1	3.05-3.5	+300	20-30	-50 -150	25-40	20-40
K3-2	2.9-3.05	+300	20-30	-50 -150	30-50	15-30
K3-3	3.5-4.0	+300	20-30	-50 -150	25-40	20-40
KT-3	3.05-3.35	+300	50-60	-50 -150	?	15-35
KT-10	9.3-10.8	+300	50-60	-50 -150	?	50-90
KT-2	1.94-2.06	+300	50-60	-50 -150	30-60	10-25
?	2.8-4.5	+300-400	(Under development in April 1952. No other details known. Waveguides used in conjunction with this tube were 10x23 mm and 12.5x28.5 mm.)			

Fine tuning of types K10-2, K3-1, K3-2, & K3-3 done electrically. Types KT-3, KT-2, and KT-10 are thermally tuned.

ENCLOSURE (A)

SECRET- SECURITY INFORMATION

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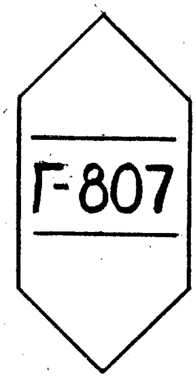

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(Month) (Week) (Year)

TYPICAL MARKINGS ON VACUUM TUBES PRODUCED AT INSTITUTE 160

Enclosure (B)

SECRET